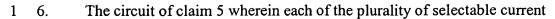
What is claimed is:

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- a voltage-to-current converter having a differential input node and a
- 3 differential output node; and
- a current multiplier coupled to the differential output node of the voltage-to-
- 5 current converter circuit.
- 1 2. The circuit of claim 1 wherein the current multiplier includes an output node,
- 2 the circuit further comprising a load device coupled to the output node of the current
- 3 multiplier.
- 1 3. The circuit of claim 1 further comprising:
- a second voltage-to-current converter having a differential input node and a
- 3 differential output node; and
- a second current multiplier coupled to the differential output node of the
- 5 second voltage-to-current converter;
- 6 wherein the current multiplier and the second current multiplier each have
- 7 differential output nodes coupled in common.
- 1 4. The circuit of claim 3 further comprising a pair of loads coupled to the
- 2 differential output nodes of the current multiplier and the second current multiplier to
- 3 develop a differential output voltage.
- 1 5. The circuit of claim 3 wherein the current multiplier comprises:
- a diode-connected control transistor; and
- a plurality of selectable current source circuits coupled to the diode-connected
- 4 control transistor.



- 2 source circuits includes:
- a current source transistor having a gate; and
- a select transistor coupled source-to-drain between a gate of the diode-
- 5 connected control transistor and the gate of the current source transistor.
- 1 7. The circuit of claim 1 wherein the current multiplier includes a plurality of
- 2 selectable current source circuits to provide a digitally controlled programmable
- 3 gain.

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- 8. The circuit of claim 7 further comprising:
- 2 a second voltage-to-current converter; and
- a second current multiplier having a digitally programmable current gain, the
- 4 second current multiplier coupled to be responsive to the second voltage-to-current
- 5 converter circuit and having an output node coupled in common with an output node
- 6 of the current multiplier.
- 1 9. The circuit of claim 7 wherein the circuit comprises a plurality of voltage-to-
- 2 current converters and a plurality of current multipliers, each of the plurality of
- 3 voltage-to-current converters being coupled to a corresponding one of the plurality of
- 4 current multipliers, and wherein the plurality of current multipliers have output nodes
- 5 coupled in common.
- 1 10. The circuit of claim 9 further comprising a load device coupled to the output
- 2 nodes coupled in common.
- 1 11. A circuit comprising:
- a differential pair of input transistors to convert a differential input voltage
- 3 into a first differential current;

- a current multiplier coupled to the differential pair of transistors to produce a
- 5 second differential current in response to the first differential current; and
- a pair of load devices to produce a differential output voltage in response to
- 7 the second differential current.
- 1 12. The circuit of claim 11 wherein the current multiplier includes a plurality of
- 2 selectable current source circuits.
- 1 13. The circuit of claim 12 wherein each of the plurality of selectable current
- 2 source circuits is configured to be responsive to a digital control signal.
- 1 14. The circuit of claim 11 further comprising:
- a second differential pair of transistors to receive a second differential input
- 3 voltage; and
- a second current multiplier coupled between the second differential pair of
- 5 transistors and the pair of load devices.
- 1 15. The circuit of claim 14 wherein the second current multiplier is configured to
- 2 vary a differential output current in response to a second set of digital control signals.
- 1 16. An integrated circuit comprising a voltage multiplier circuit that includes a
- 2 current multiplier with a digitally programmable current gain.
- 1 17. The integrated circuit of claim 16 further comprising a voltage-to-current
- 2 converter circuit coupled to an input side of the current multiplier.
- 1 18. The integrated circuit of claim 17 further including a processor coupled to the
- 2 current multiplier to provide a digital value such that an output current of the current

- 3 multiplier is responsive to the digital value and a voltage input to the voltage-to-
- 4 current converter circuit.
- 1 19. The integrated circuit of claim 16 wherein the current multiplier comprises a
- 2 plurality of current mirrors with digitally programmable gain, each of the plurality of
- 3 current mirrors having a common output node.
- 1 20. The integrated circuit of claim 19 further comprising a plurality of voltage-to-
- 2 current converter circuits, wherein each of the plurality of voltage-to-current
- 3 converter circuits is coupled to a corresponding one of the plurality of current
- 4 mirrors.
- 1 21. The integrated circuit of claim 20 further comprising a load device coupled to
- 2 the common output node to produce an output voltage from a sum of current mirror
- 3 output currents.
- 1 22. The integrated circuit of claim 16 wherein the integrated circuit is a circuit
- 2 type from the group comprising: a processor, a processor peripheral, a memory, and a
- 3 memory controller.
- 1 23. An integrated circuit comprising:
- a plurality of voltage-to-current converters to receive a plurality of
- 3 differential input voltages and produce a plurality of differential currents; and
- a plurality of current multipliers coupled to a common output node, each of
- 5 the plurality of current multipliers coupled to a corresponding one of the plurality of
- 6 voltage-to-current converters to receive a corresponding one of the plurality of
- 7 differential currents.

- 1 24. The integrated circuit of claim 23 further comprising a load device coupled to
- 2 the common output node to produce an output voltage.
- 1 25. The integrated circuit of claim 23 wherein each of the plurality of current
- 2 multipliers has a programmable current gain.
- 1 26. The integrated circuit of claim 25 wherein each of the plurality of current
- 2 multipliers includes a digital input port to influence the programmable current gain.
- 1 27. The integrated circuit of claim 25 further comprising a processor coupled to
- 2 the plurality of current multipliers to set the programmable current gain.
- 1 28. The integrated circuit of claim 23 wherein the integrated circuit is a circuit
- 2 type from the group comprising: a processor, a processor peripheral, a memory, and a
- 3 memory controller.